Classes & Objects

Class Pen

{

String Color;

Public static void main(String[] args)

{

Pen Reynolds = new Pen();

}

}

For Example, Pen is an object. Its name is Reynolds; color is white, known as its state. It is used to write, so writing is its behavior.

**An object is an instance of a class.** A class is a template or blueprint from which objects are created. So, an object is the instance(result) of a class.

**Object Definitions:**

* An object is *a real-world entity*.
* An object is *a runtime entity*.
* The object is *an entity which has state and behavior*.
* The object is *an instance of a class*.

There are 3 ways to initialize object in java.

1. By reference variable
2. By method
3. By constructor

**Example: 1. Accessing by reference variable**

***Filename: TestStudent1.java***

//Creating Student class

**class** Student{

//variable declaration (actually they are members / fields of Student class)

**int** id;

 String name;

}

//Creating another class TestStudent1 which contains the main method

**class** TestStudent1{

**public** **static** **void** main(String args[]){

//creating an object or an instance of Student

  Student s1=**new** Student();

//Initializing objects

s1.id=101;

  s1.name="Sonoo";

  //Printing values of the object

  System.out.println(s1.id);  //accessing members through reference variable

  System.out.println(s1.name);

 }

}

### Example #2: Initialization through method

**FileName: TestStudent.java**

**class** Student{

**int** rollno;

 String name;

**void** insertRecord(**int** r, String n){

  rollno=r;

  name=n;

 }

**void** displayInformation(){System.out.println(rollno+" "+name);}

}

**class** TestStudent{

**public** **static** **void** main(String args[]){

  Student s1=**new** Student();

  Student s2=**new** Student();

// initializing the value to these objects by invoking the insertRecord method.

  s1.insertRecord(111,"Karan");

  s2.insertRecord(222,"Aryan");

//displaying the state (data) of the objects by invoking the displayInformation() method.

  s1.displayInformation();

  s2.displayInformation();

 }

}

}

Examples for calling a method of an object in Java

**Example#1:**

**class** Calculation{

**void** fact(**int**  n){

**int** fact=1;

**for**(**int** i=1;i<=n;i++){

   fact=fact\*i;

  }

 System.out.println("factorial is "+fact);

}

**public** **static** **void** main(String args[]){

Calculation c=**new** Calculation();

c.fact(5);

}

}

**Example#2:**

**class** Calculation{

**void** fact(**int**  n){

**int** fact=1;

**for**(**int** i=1;i<=n;i++){

   fact=fact\*i;

  }

 System.out.println("factorial is "+fact);

}

**public** **static** **void** main(String args[]){

**new** Calculation().fact(5);//calling method with anonymous object

}

}

**Example#3:**

**class** Calculation{

**void** fact(**int**  n){

**int** fact=1;

**for**(**int** i=1;i<=n;i++){

   fact=fact\*i;

  }

 System.out.println("factorial is "+fact);

}

**public** **static** **void** main(String args[]){

Calculation c1=**new** Calculation(),c2=**new** Calculation(); // 2 objects created

**c1**.fact(5);//calling method

}

}

**REAL WORLD EXAMPLE:**

//Java Program to demonstrate the working of a banking-system

//where we deposit and withdraw amount from our account.

//Creating an Account class which has deposit() and withdraw() methods

**class** Account{

**int** acc\_no;

String name;

**float** amount;

//Method to initialize object

**void** insert(**int** a,String n,**float** amt){

acc\_no=a;

name=n;

amount=amt;

}

//deposit method

**void** deposit(**float** amt){

amount=amount+amt;

System.out.println(amt+" deposited");

}

//withdraw method

**void** withdraw(**float** amt){

**if**(amount<amt){

System.out.println("Insufficient Balance");

}**else**{

amount=amount-amt;

System.out.println(amt+" withdrawn");

}

}

//method to check the balance of the account

**void** checkBalance(){System.out.println("Balance is: "+amount);}

//method to display the values of an object

**void** display(){System.out.println(acc\_no+" "+name+" "+amount);}

}

//Creating a test class to deposit and withdraw amount

**class** TestAccount{

**public** **static** **void** main(String[] args){

Account a1=**new** Account();

a1.insert(832345,"Ankit",1000);

a1.display();

a1.checkBalance();

a1.deposit(40000);

a1.checkBalance();

a1.withdraw(15000);

a1.checkBalance();

}

}